

**Before the  
Federal Communications Commission  
Washington, D.C.**

In the Matter of:

Preserving the Open Internet  
Broadband Industry Practices

GN Docket No. 09-191

**COMMENTS OF ROBERT J. SHAPIRO AND KEVIN A. HASSETT**

Robert J. Shapiro and Kevin A. Hassett submit these comments in response to the Federal Communications Commission's request for comments regarding "A National Broadband Plan for Our Future."

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**The Challenge of Universal Access to Broadband**

As the Federal Communications Commission ("FCC" and "Commission") considers new rules that could govern or otherwise affect the pricing policies of internet service providers (ISPs), we urge the Commissioners to weigh carefully the many costs and benefits associated with any such rules. We do not propose here to provide an exhaustive survey of those costs and benefits, but rather to draw on our own research and contributions by others to a growing literature that explores the factors driving broadband adoption. This research suggests strongly that any policy or rule changes which circumscribe service providers' flexibility to charge different users different fees for access to the ISP's infrastructure could slow progress towards eliminating the "digital divide" in broadband access, especially as fast-rising demand for bandwidth forces ISPs

to sharply increase their investments in broadband infrastructure. It is unclear how providers will eventually cover the costs of these new investments, but constraining their flexibility to explore pricing approaches that pass along some of these costs to content providers may effectively force some harmonization of user fees and thereby exacerbate the digital divide. This conclusion follows from extensive data showing that broadband adoption is following the pattern of personal computers and dial-up Internet, in which market competition and technological advances steadily reduce the cost of access while expanding its utility, effectively closing gaps in access based on income and race.

Until the recent economic crisis, access to broadband Internet has been progressing at very rapid rates. Yet, despite numerous policy efforts, this progress has been unequal across many demographic groups. This is a familiar pattern. Although the Internet was viewed initially as a tool for equalizing access to information, early studies of personal computer ownership and dial-up Internet adoption found patterns of unequal access along such traditional lines as income, education and race.<sup>1</sup> Differences in the adoption rates of information technologies also have been observed across other categories, including geography, gender, employment, age, and family structure.<sup>2</sup>

The digital divide, the term coined in the 1990s to describe divisions between “information haves and have-nots” was first addressed in the Telecommunications Act of 1996, when the FCC was directed to take steps to help ensure that high-speed internet access “is being deployed to all Americans in a reasonable and timely fashion.”<sup>3</sup> Subsequently, a variety of policy approaches have been employed to expand Internet access to traditionally disadvantaged groups.

In an effort to address a disparity in computer and Internet access by lower-income and minority students, for example, President Clinton set the goal of connecting all public classrooms and libraries to the Internet by 2000. The Bush administration declared a policy goal of achieving universal broadband access by 2007, although it was often criticized for failing to take the digital divide seriously.<sup>4</sup>

In his 2008 campaign, President Obama declared that, “every American should have the highest-speed broadband access – no matter where you live, or how much money you have.”<sup>5</sup> Shortly after taking office, the President signed the 2009 American Recovery and Reinvestment Act, which committed \$7.2 billion for improving broadband

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<sup>1</sup> Losh, Susan. “Generation versus Aging, and Education, Occupation, Gender and Ethnicity Effects in the US Digital Divides.” *The Proceedings, Atlanta Conference on Science and Innovation Policy* (2009); Ono, Hiroshi and Madeline Zavodny. “Immigrants, English Ability and the Digital Divide.” *HeinOnline Social Forces* Vol. 86 No. 4 (2008).

<sup>2</sup> DiMaggio, Paul et al. “From Unequal Access to Differentiated Use: A Literature Review and Agenda for Research on Digital Inequality.” Prepared for the Russell Sage Foundation (2004).

<sup>3</sup> Kruger, Lennard and Angele Gilroy. “Broadband Internet Access and the Digital Divide: Federal Assistance Programs.” Congressional Research Services Report for Congress (2009).

<sup>4</sup> DiMaggio et al. (2004).

<sup>5</sup> Remarks of Senator Barack Obama: Renewing American Competitiveness. Organizing for America. Flint, MI (2008).

access and directed the Federal Communications Commission (FCC) to create a “national broadband plan” to be delivered to Congress by February 17, 2010.<sup>6</sup>

## **Benefits of Broadband Access**

As broadband technologies continue to permeate the offices and operations of governments, businesses, and households, there are growing concerns that those without broadband access will be increasingly isolated from the rest of society. Online government services, access to healthcare information, educational services, job searching and community involvement are among the many vital broadband-enabled functions.

Numerous academic studies recognize the expanding roles and uses of Internet technologies, and the consequent growing importance of access to these technologies. Mossberger et al. assert, for example, that “‘Digital citizenship,’ or the capacity to use information technology, enables individuals to participate fully in society.”<sup>7</sup> Similarly, Hu and Prieger note that, “given that more and more websites make use of bandwidth-intensive technologies such as audio and video files, animated content and interactive applets, broadband connection is becoming increasingly necessary to participate fully in cyberspace, and by extension, society.”<sup>8</sup>

A growing literature also has identified the important role that broadband technology plays in the economy. The FCC has noted, “the ability to share large amounts of information at ever-greater speeds increases productivity, facilitates commerce, and drives innovation. Broadband is changing how we communicate with each other, how and where we work, how we educate our children, and how we entertain ourselves.” Similarly, a 2007 Brookings Institution study estimated that every one percentage-point increase in broadband penetration is accompanied by an increase in employment of 0.2 percent to 0.3 percent, per-year;<sup>9</sup> and Dutz, Orszag and Willig estimate that home broadband access generates consumer benefits of up to \$30 billion per-year.<sup>10</sup>

Dynamics in U.S. labor markets also demonstrate the increasing importance of information-technology-related knowledge and skills. Autor, Katz and Kearney found that computer skills have become a key factor in the labor market, and the burgeoning

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<sup>6</sup> Federal Communications Commission. “What is Broadband?” Consumer and Governmental Affairs Bureau (2010) <http://www.fcc.gov/cgb/broadband.html>; Federal Communications Commission. “Recovery Act Broadband Initiatives.” FCC Recovery (2010). <http://www.fcc.gov/recovery/broadband/>; Kruger and Gilroy (2009).

<sup>7</sup> Mossberger, Karen, Caroline Tolbert and Michele Gilbert. “Race, Place and Information Technology.” *Urban Affairs Review* 41 (2006): 583.

<sup>8</sup> Hu, Wei-Min and James Prieger. “The Broadband Digital Divide and the Nexus of Race, Competition and Quality.” *Information Economics and Policy* 20.2 (2008): p. 150-167.

<sup>9</sup> Crandall, Robert, William Lehr, and Robert Litan. “The Effects of Broadband Deployment on Output and Employment: A Cross-sectional Analysis of U.S. Data.” *Issues in Economic Policy: the Brookings Institution* (2007).

<sup>10</sup> Dutz, Mark, Jonathan Orszag and Robert Willig. “The Substantial Consumer Benefits of Broadband Connectivity for U.S. Households.” Commissioned by the Internet Innovation Alliance (2009).

information technology industry has maintained one of the highest occupational demands over the past decade.<sup>11</sup>

Broadband is increasingly important in other spheres as well. A 2009 Survey of broadband users, for example, found that 65 percent of respondents believe broadband access is very important or somewhat important for “communicating with health care or medical providers,” and 68 percent agreed that broadband is important for “finding out what is going on in your community.” In addition, 62 percent of respondents believe that broadband access is very or somewhat important for “contributing to economic growth in your community,” and 57 percent believe it is very or somewhat important for communicating with government officials about issues. And 58 percent believe that broadband access is important for “sharing your views with others about key issues.”<sup>12</sup>

The Internet’s fast-expanding capacity to provide audio and video products and services, along with the rapid growth of mobile broadband devices such as Blackberry’s and iPhones, demonstrate the growing impact of broadband on many aspects of people’s daily lives. And a number of surveys have found that broadband subscribers use the Internet in greater and different ways than dial-up subscribers. Horrigan and Smith, for example, report that 79 percent of broadband users use the Internet to get news, compared to 61 percent for home dialup; home broadband users are also more likely to upload their own content; and job-related research, blogging and gathering information about hobbies or interests are also higher for broadband users.<sup>13</sup>

All of this research suggests that both the social benefits of enabling universal broadband access, and the cost of policies that could impede that progress, could be great.

In the next section of these Comments, we draw on Hassett and Shapiro (2009) and discuss the link between universal access to broadband and various approaches for pricing that access.<sup>14</sup> In that study, we considered a range of end-user pricing strategies to cover the cost of the large investments that almost certainly will be necessary to accommodate the fast-rising demand for bandwidth associated with the spread of video and audio applications, and their impact on the digital divide. We find that flexible pricing models that allow ISPs to shift portions of the costs of their additional investments to the largest users of bandwidth could mitigate the adverse effects on access by lower-income households. By contrast, a pricing system that forces ISPs to pass along the costs of their additional investments on an “equal” basis across subscribers, in higher monthly fees for all consumers or all content providers, could significantly set back broadband adoption by lower-income Americans. The key observation with regard to the

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<sup>11</sup> Autor, David H., Lawrence F. Katz, and Melissa S. Kearney. “The Polarization of the U.S. Labor Market.” NBER Working Paper 11986 (2006); Fairlie (2004).

<sup>12</sup> Horrigan, John. “Home Broadband Adoption 2009.” Pew Internet and American Life Project (2009).

<sup>13</sup> Horrigan, John and Aaron Smith. Data Memo: Home Broadband Adoption 2007. Pew Internet and American Life Project (2007); Horrigan, John. “Home Broadband Adoption, 2006.” Pew Internet and American Life Project (2006).

<sup>14</sup> Hassett, Kevin and Robert J. Shapiro. “Towards Universal Broadband: Flexible Broadband Pricing and the Digital Divide.” The Georgetown Center for Business and Public Policy (2009).

FCC's current rule-making effort is that while the optimal pricing strategy for distributing these increased network costs across different end-users and/or content providers may be unclear, considerations of universal access should make the Commission extremely cautious about any rule-making that could effectively compel pricing to be highly uniform or skewed disproportionately upon end-users, and, thus, unnecessarily burdensome for end-users with lower incomes.

In the final section of these Comments, we discuss recent evidence examining variations in broadband access by racial groups and describe evidence that suggests that our earlier results are highly relevant in understanding racial differences in broadband access, as well as income-based differences.

### **Pricing and Diffusion**

Broadband access has increased over the past decade in line with a general downtrend in its price, a pattern typical of the diffusion of other, new information technologies. As detailed in a 2006 study, these technologies tend to diffuse across income groups as their usefulness increases and their prices decline.<sup>15</sup> From 2001 to 2007, for example, the share of households with broadband access increased from 9.1 percent to 50.8 percent.<sup>16</sup> There is no doubt about the expanding utility of broadband over this period, and respondents to the Pew survey reported that their average bills for broadband service fell over the same period \$39 per-month (2004) to \$34.50 per-month (2008). Interestingly, overall adoption rates continued to rise in 2009, despite a jump in access prices back to the 2004 level. However, this latest access increase contains some troubling trends by groups, which we will return to shortly.

To some extent, the higher access prices seen in 2009 may reflect the willingness by a growing number of Americans to pay more for premium broadband service that provides even higher speeds. According to the Pew survey, the average monthly price of basic service stood at \$37.10 in 2009, while premium subscribers paid an average of \$44.60. Further, economic studies have found that households which already have adopted broadband are far less price sensitive or "price elastic" than prospective adopters.<sup>17</sup> Small price increases for current broadband subscribers, especially middle-income and high-income subscribers, are unlikely to drive them back to dial-up service. However, the higher prices can have a much larger effect on the Internet subscription choices of households currently without service or those which currently use dial-up and are considering an upgrade in their service. In this respect, the evidence suggests that low-income households are particularly price sensitive.

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<sup>15</sup> Shapiro, Robert J. "Creating Broad Access to New Communications Technologies: Build-Out Requirements Versus Market Competition and Technological Progress." Sonecon, LLC (2006).

<sup>16</sup> US Department of Commerce. "Networked Nation: Broadband in America 2007." National Telecommunications and Information Administration (2008).

<sup>17</sup> Flamm, Kenneth and Anindya Chaudhuri. "An Analysis of the Determinants of Broadband Access." *Telecommunications Policy* 31 (2007): 312-326.

These findings and other data suggest that adoption would have been even higher in 2009 if the price increases had not occurred. Pew reports that almost one in ten Americans either cancelled or cut back Internet service for financial reasons between April 2008 and April 2009. Moreover, these cutbacks were greatest at the bottom of the income distribution, with 17 percent of households earning \$20,000 or less reporting that they reduced or gave up service during 2008.

To be sure, price is not the only factor determining broadband adoption rates and trends. Roughly seven percent of Americans who use the Internet rely on dialup connections rather than broadband, and almost one in five of these dialup consumers say that “nothing would get me to switch” to broadband.<sup>18</sup> Further, among those who use dialup service or are not online at all, roughly half indicate that they do have no interest in broadband service. The success of private-public initiatives such as Connect Kentucky, however, suggests that some of this resistance can be overcome through aggressive outreach efforts and “digital literacy” programs that help non-users appreciate the benefits of connectivity.

A number of studies, however, *have* found that price is the single-largest determinant of broadband subscription, and especially among lower income groups. One study, for example, found that at \$20 per-month, a 10 percent increase in price reduces demand by 5.3 percent (a price elasticity of demand of - 0.53); while at a price of \$50 per-month, close to the then-actual market price, a 10 percent price increase reduces demand by 9.8 percent.<sup>19</sup> Further, another study conducted by Austan Goolsbee, now a member of the President’s Council of Economic Advisors, found that significantly larger shares of affluent people were willing to pay higher prices for broadband than less-affluent people.<sup>20</sup> In a similar vein, another analysis found that a 10 percent increase in the price of high-speed connections in 2000 reduced demand for those connections by 10.8 percent overall, but by 15.9 percent among those with incomes of less than \$25,000, compared to 8.5 percent to 10 percent for higher income groups.<sup>21</sup> And the 2009 Pew survey found that lower prices could persuade significant numbers of dial-up users to switch to broadband; and among those who use dial-up or are not online at all, one-in-five cite affordability as the main reason they do not have broadband service.<sup>22</sup>

The challenge is that bandwidth demand has been rising rapidly with the fast-expanding use of video and voice applications, and industry experts project that ISP providers will have to substantially increase their investments to accommodate the larger bandwidth demand. In one, widely-cited report, EDUCAUSE, a higher-education technology group estimated that providing “big-broadband” to every home and business, with sufficient bandwidth to meet demand, would cost an additional \$100 billion over the

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<sup>18</sup> Horrigan (2009).

<sup>19</sup> Rappoport, Paul, Lestor D. Taylor and Donald J. Kridel. “Willingness to Pay and the Demand for Broadband Service.” mimeo (2003).

<sup>20</sup> Goolsbee, Austan. “The Value of Broadband and the Deadweight Loss of Taxing New Technology,” Discussion Paper, University of Chicago (2006).

<sup>21</sup> Duffy-Deno, Kevin. “Demand for High-Speed Access to the Internet Among Internet Households,” ICFC 2000 Seattle (2000).

<sup>22</sup> Horrigan (2009).

next three to five years and even larger investments in capacity going forward.<sup>23</sup> Another estimate cited by David McClure, the head of the U.S. Internet Industry Association, and John Ernhardt, Senior Manager of Policy Communications for Cisco Systems, projects that the long-term investments required to keep up with fast-rising bandwidth demand could cost providers an additional \$300 billion over 20 years, on top of their trend level investments, while the FCC broadband task force suggests that the number might be as high as \$350 billion.<sup>24</sup>

While some of these projected additional investments could be funded by the fees paid by new subscribers, demand for bandwidth is growing much faster than increases in uptake rates. Therefore, a significant portion of the additional costs to expand the infrastructure will have to be passed on either to end-user broadband subscribers or content providers in higher prices. The challenge for policymakers is to ensure that policy does not force broadband networks to allocate these price increases in ways that would perpetuate or even exacerbate the existing divides in end-user broadband access based on income as well as race.

In our 2009 study, we estimated the impact of an additional \$300 billion in ISP investment over the next 20 years, on access prices and access by income groups. We found that if policy forced ISPs to pass along these costs in higher fixed monthly fees, the effects on the digital divide in broadband would be dramatic. While the price increases would affect all income groups, the greatest impact would be felt by lower-income and middle-income families. In our baseline case, which assumes the diffusion rates by income for personal computer ownership and dial-up Internet, with no additional investment costs factored into prices, the rate of broadband adoption among lower-income households increases by more than 34 percentage points by 2013. When the additional costs are factored in, however, broadband access by lower-income households increases at a significantly lower rate. By 2017, almost 20 percent fewer lower-income households would have broadband access, compared to the baseline case: 79.4 percent with the additional investments costs passed along in higher monthly prices for everyone, compared to 99.0 percent in the baseline case. Similarly, by 2017, more than 13 percent fewer middle-income households would have broadband access if the additional costs are included in higher, uniform monthly fees, compared to the baseline (85.7 percent with broadband access, compared to 99.0 percent).

We also simulated access rates with a more flexible pricing strategy, in which 80 percent of the additional investment costs were borne by very heavy broadband users and only 20 percent of those costs were passed along in higher monthly fees for everyone else. Using established elasticities for different income groups, this analysis found that the underlying trend towards universal access found in the baseline case, based on the diffusion rates by income for PC ownership and dial-up access, is substantially maintained: Thus by 2017, more than 90 percent of lower-income households and nearly

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<sup>23</sup> Windhausen, John Jr. "A Blueprint for Big Broadband." EDUCAUSE White Paper (2008).

<sup>24</sup> McClure, David. "The Exabyte Internet." U.S. Internet Industry Association (2007); FCC Task Force on the National Broadband Plan. Presentation to the FCC: September Commission Meeting (2009). [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-293742A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-293742A1.pdf)

98 percent of middle-income households would have broadband service. The same mitigating effects on the digital divide would hold true if some portion of the additional investment costs were contributed by bandwidth-intensive Internet content or applications providers. Indeed, some link in this regard may be the most efficient way to ensure that very high bandwidth users do not drive up connection costs for everyone else.

### **Recent Demographic Trends**

Recent data suggest that the profound downturn of 2008-2009 should heighten our concerns about the digital divide in broadband service, especially as it affects racial and ethnic minorities. Historically, African-Americans and Hispanics have trailed whites in their access to dial-up Internet and broadband. For example, in 2000, Pew found that 36 percent of African-American households and 44 percent of English-speaking Hispanic households were connected to the Internet, compared with 50 percent of whites.<sup>25</sup> In 2003, the Commerce Department reported that 65 percent of whites had Internet access, compared to 45.6 percent of African Americans and 37.2 percent of all Hispanics. In that year, 25.7 percent of whites also lived in households with broadband connections, compared to 14.2 percent of African Americans and 12.6 percent of Hispanics.<sup>26</sup>

The U.S. Commerce Department's 2004 report, "A Nation Online," painted an optimistic picture of the digital divide with regard to race. The report noted that, "Internet use has increased across all races and groups, and growth in Internet use rates was faster for Blacks and Hispanics than for Whites and Asian American and Pacific Islanders," indicating that the racial divide might soon be a thing of the past.<sup>27</sup> Between 2005 and 2007, Pew found that African American households nearly tripled their usage of broadband in the home, while the gap between whites and Hispanics had nearly closed. From the beginning of 2005 to the end of 2006, for example, the broadband adoption rate of African Americans increased 121 percent.

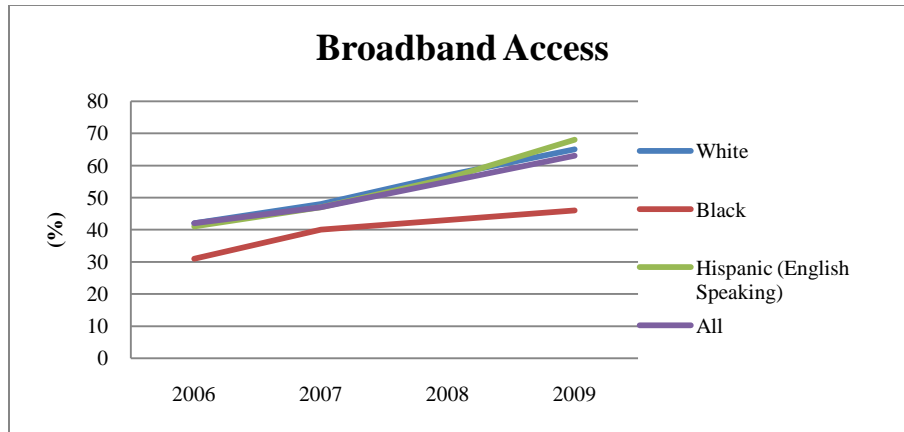
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<sup>25</sup> Lenhart, Amanda. "Who's Not Online: 57% of Those Without Internet Access Say They Do Not Plan to Log On." Pew Internet and American Life Project (2000).

<sup>26</sup> US Department of Commerce. "A Nation Online: Entering the Broadband Age." Economics and Statistics Administration, National Telecommunications and Information Administration (2004).

<sup>27</sup> US Department of Commerce. "A Nation Online: How Americans are Expanding Their Use of the Internet." Economics and Statistics Administration, National Telecommunications and Information Administration (2002).





Yet, the gap in broadband access between African-Americans and whites widened in both 2008 and 2009. Although overall home broadband adoption rose 15 percent between 2008 and 2009, there was no significant growth in access by African Americans. Similarly, despite the gains by English-speaking Hispanics seen in Pew data, surveys that include non-English speaking Hispanics found far lower rates of broadband adoption by all Hispanics. Surveys conducted by the Pew Hispanic Center in 2006 reported that only 29 percent of Hispanic adults had a home broadband connection, compared to 40 percent of African-Americans and 47 percent of the total population.<sup>28</sup> The same report also noted that only 32 percent of Spanish-language-dominant Hispanic adults use the Internet at all. Census data from 2007 also indicate that Hispanics trailed African-Americans in their Internet usage and broadband access in the home, with 43.4 percent of Hispanics reporting home Internet access (compared to 44.9 percent for African-Americans) and 35.2 percent reporting home broadband access (compared to 36.4 percent for African-Americans).<sup>29</sup>

Racial divides are also apparent in more recent data on dialup and broadband users. In 2009, 73 percent of broadband users were white, eight percent were African-American, and 13 percent were Hispanic. Among dialup users, 65 percent were white, 17 percent were African-American, and 12 percent were Hispanic. It should be noted, however, that at least one study has found comparable Internet use across racial groups: Fairlie (2004) found Mexican-Americans, African-Americans and whites used the Internet to check email, search for information, and check news, weather and sports, all at approximately the same rates.

As noted earlier, income has been identified as a key factor determining broadband access. But numerous studies also have found significant gaps in broadband adoption between minorities and whites when the researchers control for other

<sup>28</sup> Fox, Susannah and Gretchen Livingston. "Latinos Online: Hispanics with Lower Levels of Education and English Proficiency Remain Largely Disconnected from the Internet." Pew Internet and American Life Project, Pew Hispanic Center (2007).

<sup>29</sup> US Department of Commerce. "Table 1118: Household Internet Usage in and Outside of the Home by Selected Characteristics, 2007." National Telecommunications and Information Administration (2008).

socioeconomic factors.<sup>30</sup> In 2000, for example, the U.S. Commerce Department estimated that differences in income and education accounted for about half of the gap in Internet usage between whites and Hispanics and African-Americans.<sup>31</sup> Similarly, Fairlie (2004) found that income explains about 27 percent of the gap between whites and African Americans with regard to personal computer ownership and 15.4 percent of the difference with regard to Internet access, while education explains another 12.7 percent of the computer-ownership gap and 5.8 percent of Internet access gap. Similarly, about 30 percent of the gap in home computer access between Mexican-Americans and whites was due to education, while about 25 percent was due to income differences; education also explained 19.1 percent of the disparity in Internet access between Mexican Americans and whites, while income explained 15.6 percent of the gap.

The literature on race and the digital divide has examined a variety of explanations for the gap in broadband adoption across ethnicities when researchers control for income and education. Geography cannot explain it: The FCC reported in 2006 that broadband was accessible to Americans in 99 percent of all zip codes; and in 2008, 91 percent of zip codes contained ADSL or cable modem connections.<sup>32</sup> Similarly, studies of the supply of broadband have ruled out the availability of broadband as a key factor.<sup>33</sup> In a study of DSL subscribers, Hu and Prieger (2008) conclude that “the availability of broadband is less of a determinant of the access gap over time, as broadband access has now diffused over much of the U.S.” However, they also found that a lack of competition among DSL providers lowered the probability of DSL subscriptions by African-Americans.

Moreover, several studies have concluded that age, along with income and education, may account for most of the racial and ethnic differences in Internet usage.<sup>34</sup> A number of other studies have documented that broadband demand is sensitive to a household’s ability to speak and understand English. A 2002 Commerce Department report noted that differences in English language abilities account for part of increase in the gap in IT usage between Hispanics and whites that occurred in the latter 1990s and

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<sup>30</sup> Cooper, Mark. “Explaining the Digital Divide and Falling Behind on Broadband: Why a Telecommunications Policy of Neglect is not Benign.” Consumer Federation of America (2004); Hu and Prieger (2008).

<sup>31</sup> US Department of Commerce. “Falling Through the Net: Toward Digital Inclusion.” National Telecommunications and Information Administration (2000).

<sup>32</sup> Federal Communications Commission. “High-Speed Services for Internet Access: Status as of June 30, 2008.” Industry Analysis and Technology Division, Wireline Competition Bureau (2009).

<sup>33</sup> Prieger, James. “The Supply Side of the Digital Divide: Is There Equal Availability in the Broadband Internet Access Market?” University of California, Davis (2003); Hu, Wei-Min and James Prieger. “The Timing of Broadband Provision: the Role of Competition and Demographics.” AEI-Brookings Joint Center for Regulatory Studies. Working Paper (2007).

<sup>34</sup> Rice, Ronald and James Katz. “Comparing Internet and Mobile Phone Usage: Digital Divides of Usage, Adoption and Dropouts.” *Telecommunications Policy* 27 (2003): 597-623; Leigh, Andrew. “Digital Divide and Broadband Divide – Some Multiple Regression Results.” Malcolm Wiener Center for Social Policy at Harvard University (2003); LaRose, Robert et al. “Closing the Rural Broadband Gap: Promoting Adoption of the Internet in Rural America.” *Telecommunications Policy* 31 (2007): 359-373.

early 2000s.<sup>35</sup> Similarly, Hu and Preiger (2008) found that ‘linguistically isolated’ households that did not speak English as a first language or did not speak English “very well” as a second language were 18.6 percent less likely to adopt a DSL connection. Ono and Savodny (2008) also found that the ability to speak English is an important factor driving IT access and use. Using Census data from 1997 and 2003, they calculate ratios for immigrants compared to U.S. natives, and found a ratio of 0.87 for computer ownership, and 0.70 for home Internet use. Further, the ratio for Spanish-speaking immigrant households compared to U.S.-born Americans was 0.42 for computer ownership, while the ratio of native Spanish-speaking households to other native households was 0.85. Other studies found that Mexican Americans were half as likely to own a computer and one-third as likely to have home Internet access as whites, and that language barriers play a substantial role in these gaps.<sup>36</sup>

Other factors also may play a role, including the speed of a broadband connection. Hu and Priege (2008) examined DSL demand using data from Ameritech, a DSL provider in five Midwestern states.<sup>37</sup> They found a relationship between DSL demand and the length of DSL line from a central office, since transmission speeds decrease when customers reside farther away (beyond 2.2 miles) from a central office. Their results show that increasing a household’s distance from the central office from one mile to 1.1 miles lowers the household’s probability of subscribing to broadband by 5.7 percentage points. Their study indicates that lack of a distance control in broadband access studies will produce an underestimate of the gap between Hispanic and white households.

Strikingly, research also shows that despite their lower rates of access to and skills with information technologies, African Americans and Hispanics view computers and the Internet more favorably than whites.<sup>38</sup> Surveys have found that 78 percent of African Americans and 80 percent of Latinos view the internet as important for economic opportunity and ‘keeping up with the times,” compared with 65 percent for whites. To explain this phenomenon, Mossberger et al. (2006) hypothesize that lower access to computers and the Internet in areas of concentrated poverty explain the differences in actual adoption rates. After controlling for concentrated poverty and low-socioeconomic status, the study found that African Americans, whites and Asians had similar access to home computers; but the gap for Hispanics remained.

Similarly, Dutz, Orszag and Willig (2009) note the high value African-Americans ascribe to Internet service, while examining the extent to which income, age, race and ethnicity, education, and employment affect people’s willingness-to-pay for broadband:

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<sup>35</sup> Ono and Zavodny (2008).

<sup>36</sup> Fairlie (2004).

<sup>37</sup> IL, IN, MI, OH, WI.

<sup>38</sup> Mossberger, Karen, Caroline Tolbert and Mary Stansbury. *Virtual Inequality: Beyond the Digital Divide*. Washington D.C.: Georgetown University Press 2003.

“... One striking difference emerges where households are disaggregated by race/ethnicity: black/African-American households have a below-average adoption rate of 57 percent, while the valuation of connected black/African-American households, at \$32.10, is above average (though statistically indistinguishable from the valuation of white/Caucasian households at \$28.69 and of Asian households at \$27.47). This is explained by the large number of black/African-American households that still have no home Internet connection, which is why the overall adoption rate is so low. On the other hand, those online black/African-American households that have experienced a connection to broadband at home value the experience highly.”

Taken together, these findings suggest very strongly that digital divides in broadband access based on race and ethnicity, like those based on income, will continue to pose difficult challenges for policymakers. The research also establishes that pricing and other economic factors can play a significant role in either eliminating or perpetuating these divides.

## **Conclusion**

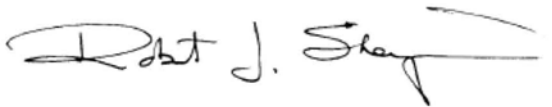
As virtually every American public and private institution, corporation and group has adopted an enormous range of information and communications technologies, the importance for every American of being connected to the Internet infrastructure that enables and links these technologies has grown sharply. Great progress has been achieved in connecting the majority of Americans to broadband Internet over the last decade as its usefulness has increased and its price has declined. Nevertheless, critical gaps remain based on income, education, language, race and ethnicity. Moreover, recent economic trends have stalled much of the recent progress in eliminating these digital divides, increasing the urgency of policymakers addressing this critical matter.

The fast-expanding uses of broadband, especially using bandwidth-intensive video and voice applications, will necessitate much greater investments in the Internet infrastructure to handle the sharply-rising demand for bandwidth. Data also indicate that a minority of Internet users and applications may account for most of this sharply-rising bandwidth demand. Therefore, given the importance of declining prices in driving broadband access, especially for minorities and lower-income Americans, a critical question for policy makers intent on promoting universal broadband access is how the additional costs arising from those investments will be funded. Our analysis shows that if ISPs are forced by rule or regulation to pass along those costs only to Internet end-users, and on an equal basis, it would significantly impede future progress towards universal broadband access. Data show, for example, that lower-income Americans already are less likely to sign up for broadband service, in large measure because they cannot afford it. This group should not be required to effectively subsidize high-bandwidth consumers and application providers under a pricing model that would charge only end-users a harmonized fee, even as many of lower-income and minority households are deterred from adopting broadband because they cannot afford to pay a higher share of their

incomes for the connection. This outcome would almost certainly expand the existing digital divides based on race, ethnicity, income, education and language.

In promoting universal access, the FCC should maintain the ability of ISPs to adopt flexible pricing and network management strategies which can effectively focus much of the additional costs to expand the infrastructure to those whose use or applications require the extensive bandwidth driving that expansion.

Respectfully submitted,

Handwritten signature of Robert J. Shapiro in black ink.

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